

**Remarks**

Claims 1-31 and 33-36 are pending in the application. Claim 32 was previously canceled. Claims 1 and 26 have been amended. No new matter has been added by virtue of this amendment. Reconsideration of the application in view of this response is requested.

**Claim Rejections-- 35 U.S.C. § 103**

The Examiner rejects claims 1-10, 15, 18-23, 25, 27 and 36 under 35 U.S.C. § 103(a), as being unpatentable over Davis. The Examiner states that:

Davis does not explicitly teach the dimensions of the device as recited in claims 1-6. Nonetheless, modifying Davis to have the relative dimensions as recited in the claims would be obvious to one having ordinary skill in the art through routine experimentation because where the only difference between the prior art and the claims was a recitation of the relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device. See *Garder v. TEC Systems, Inc.*, 220 USPQ 777 (Fed. Cir. 1984), cert denied, 225 USPQ 232 (1984). One having ordinary skill would thus be motivated to do in view of Davis, which recognized a need for a small sized transducer (See col. 1, lines 16-57).

However, first applicant would respectfully ask the Examiner to consider that the Davis patent does not provide enabling disclosure as to how to provide the 3mm dimension provided in claim 1. It was applicant who determined how to accomplish this. As described in Davis, none of the teachings of the prior art allowed for such a small outside dimension. Mere scaling the size of every component would wreck some of the components for their intended purposes, including the roller bearing, and Davis did not propose such a scaling of the size of all components to achieve his objective of a shorter length. Until the present patent application showed how to do it, no process existed for fabricating a displacement sensor as described in claim 1 that allowed these dimensions. A prior art reference must provide an enabling disclosure of how to make the device with this dimension before such a dimension can be considered obvious. Davis actually teaches a need to increase the dimension beyond the 8-10 mm of the prior art (column 1, line 17). There is no teaching or suggestion as to how to make devices that could decrease the dimension to achieve the 3mm dimension of claim 1.

Applicant would also respectfully ask the Examiner to consider that the claimed device will perform in a different manner than the Davis device, and it was by providing

this difference in how it works that the present inventors were able to reduce the dimension. The claimed device eliminates most of the parts of the Davis device, which allows the substantial reduction in diameter. This reduction is unattainable with the design of Davis. For example, ball bearings are likely to have substantially degraded performance if scaled down so that the balls are small enough that the outside dimension is less than 3mm.

Just as substantial invention was required to reduce the length of the prior art device of FIG. 1 of Davis to provide the shorter device of FIG. 2, so substantial further invention would be required to shrink the diameter of either FIG. 1 from the 8mm to 10mm specified in Davis (column 1, line 17) down to less than 3mm. Davis notes that with his invention "we have been able to reduce substantially the overall length of the transistor without increasing its diameter appreciably and furthermore without detracting from its freedom of movement and accuracy." Thus, Davis acknowledges an increase in diameter from the 8mm to 10mm size with his invention. There is no teaching or suggestion in Davis or any other reference how to shrink that diameter to less than 3.00 mm while retaining functionality specified by Davis.

Second, Applicant has amended claim 1 to include the limit "wherein said second bearing has a second-bearing-outside diameter that is greater than said coil inside diameter." Thus, claim 1 is clearly distinguished from the teachings and suggestions of Davis. Further invention would be needed in Davis to meet such a condition, as shown in FIGS. 1 and 2.

Therefore, the rejection of claim 1, and claims dependent thereon, including claims 2-10, 15, 18-23, 25, 27 and 36 under 35 U.S.C. § 103(a), as being unpatentable over Davis has been traversed.

In addition, with regard to the even smaller dimensions of claims 2-6 it would be even harder to shrink Davis. With regard to claim 20, applicant would ask the Examiner to consider that the spring of Davis is within core 2 rather than the core extending through the spring.

The Examiner rejects claim 35 under 35 U.S.C. § 103(a), as being unpatentable over Tsuboi in view of ordinary skill in the art. However, Tsuboi does not provide enabling disclosure as to how to provide the center to center spacing of less than 3mm provided in claim 35. It was applicant who determined how to accomplish this. None of the teachings of the prior art allowed for such a small center to center spacing. Until the present patent application showed how to do it, no process existed for fabricating an array of devices that allowed for such a small center to center spacing. A prior art reference must provide an enabling disclosure of how to make the array of devices with this center to center spacing before such an array can be considered obvious.

The teachings of Davis, also cited by the Examiner and described herein above, demonstrate that in shrinking the length Davis actually increased the diameter of his device. Davis did not merely scale all parts down in size to achieve his objective of a smaller length. Thus, Davis provides evidence that merely scaling the size of parts down in all dimensions will not work to obtain a smaller device. Shrinking the diameter is needed for providing a smaller center to center spacing, and so far, no one but the present applicants has given enabling disclosure as to how to do that. Thus, it was not within the ordinary skill in the art.

In the case of Tsuboi, only schematic diagrams and general description are given without any mention of how to actually build a functioning array of displacement sensors. There is no mention of how large it might be and what dimensions each sensor might have and what center to center spacing would be in an array. There is no disclosure as to how to provide a desired diameter or center to center spacing. There is no teaching or suggestion as to how to make devices in a size that could achieve an array with the center to center spacing of claim 35. Therefore, the rejection of claim 35 under 35 U.S.C. § 103(a), as being unpatentable over Tsuboi has been traversed.

#### Allowable Subject Matter

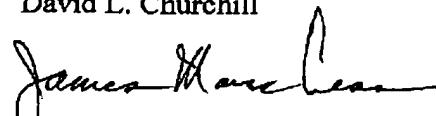
Applicant wishes to thank the Examiner for the allowance of claims 28-31, 33, and 34 and for the allowance of claims 11-14 and 26 if rewritten in independent form.

The Examiner states that claims 28-34 are allowed for the same reasons as identified in the June 21, 2005 office action. There the Examiner stated that claim 28 was allowable because the prior art does not disclose the length of contact between captive core and bearing being less than the stroke length for the two bearings. In the response to arguments section of this office action the Examiner also states it was "the dimensions of the bearings in combination with other features of the claim, i.e. the structural features of the bearings also included in claim 28 that made claim 28 allowable." While the Davis reference, cited by the Examiner in this office action, shows a small length of contact between captive core and bearing, applicant agrees that claim 28 describes other limitations directed to the dimension of one or more bearings that distinguish claim 28 from the references.

Applicant would note that a limit related to the dimensions of the bearings has been included in claim 1 by virtue of this amendment.

It is believed that the claims are in condition for allowance. Therefore, applicant respectfully requests favorable reconsideration. If there are any questions please call applicant's attorney at 802 864-1575.

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